

Agricultural Research Sustains Productivity Growth and Earns High Returns

Over the last several decades, the U.S. agricultural sector has sustained a high rate of productivity growth, driven largely by the Nation's agricultural research system, encompassing Federal-State public research as well as private research (see chart on page 39). Economic analysis finds strong and consistent evidence that investment in agricultural research has yielded high returns per dollar spent. These returns include benefits not only to the farm sector but also to the food industry and consumers in the form of more abundant commodities at lower prices. While studies give a range of estimates of returns to agricultural research, there is a consensus that the payoff to society from the government's investment in agricultural research has been high.

ERS analyzed findings from 27 studies that estimated the economic return to public agricultural research in the United States. These studies assessed both farm sector and economy-wide impacts. Although study methodology and coverage varied, more than four out of five of the estimated rates of return to research ranged between 20 and 60 percent, with a median estimate of 45 percent. This is an exceptional return on a public invest-

ment, given that a common benchmark for such investments is 3 to 4 percent per annum (the interest paid on government borrowing).

Research is an investment that pays off slowly over time as innovations are developed by scientists and adopted by farmers, providing long-term economic benefits (as long as 30 years). Given the cost of public funds and the median estimate of the rate of return to public research from the reviewed studies, each dollar spent on public agricultural research has returned roughly \$10 in benefits to the economy. Furthermore, the studies found that these benefits are shared widely throughout the economy. As a result, the social returns earned by investments in agricultural research are likely to be much higher than the private returns a company could earn from such investments.

Returns to research have been high for most crop and livestock commodities. Furthermore, technology developed in one State or region is often applied in other regions or countries. These agricultural research "spillovers" are typically higher for livestock-related research than they are for crop research. And while fewer studies are available on the benefits of private sec-



Scott Bauer, USDA/ARS

tor research, it appears that here, too, society as a whole benefits.

Important gaps in our knowledge of research returns still exist. Notably, there has been limited empirical work assessing returns to agricultural research on nonmarket objectives such as natural resource quality, food safety, economics, and policy. Since the private sector is unlikely to invest in much research in these areas, they are major goals for public agricultural research. **W**

Keith Fuglie, kfuglie@ers.usda.gov
Paul Heisey, pheisey@ers.usda.gov

This finding is drawn from . . .

Economic Returns to Public Agricultural Research, by Keith O. Fuglie and Paul W. Heisey, EB-10, USDA, Economic Research Service, September 2007, available at: www.ers.usda.gov/publications/eb10/

Estimated social rates of return to U.S. agricultural research are high

	Number of estimates	Mean estimate	Median estimate
		Percent	
Social rate of return to public agricultural research	35	53	45
Social rate of return to private agricultural research	4	45	45

Source: Huffman, Wallace E., and Robert E. Evenson, *Science for Agriculture: A Long-Term Perspective*, 2nd edition, Ames, IA: Blackwell Publishing, 2006; and *Agricultural Research and Development: Public and Private Investments Under Alternative Markets and Institutions*, www.ers.usda.gov/publications/aer735/.